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MATHEMATICS 24

STUDENT MATERIALS

CLASSROOM
ASSESSMENT
MATERIALS

MATHEMATICS 24

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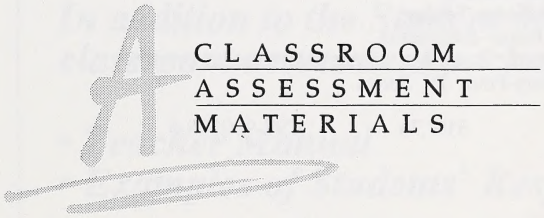

Alberta
EDUCATION

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Mathematics 24

This package of Student Materials contains

- *End-of-Course Exam*
- *Performance Assessment*

In addition to the Student Materials, this classroom assessment package includes

- *Teacher Manual*
- *Examples of Students' Responses*

CLASSROOM ASSESSMENT MATERIALS

Mathematics 24

End-of-Course Exam

End-of-Course Exam

Description

Time allotted: 2 hours
Total possible marks: 56

This is a **closed-book** test consisting of **two** parts:

Part A
has 36 selected-response questions, each with a value of one mark.

Part B
has 4 written-response questions for a total of 20 marks.

Instructions

- Fill in the information required on the answer sheet and the test booklet as directed by your teacher.
- You are expected to provide your own calculator.
- Carefully read the instructions for each part before proceeding.
- Do not fold the answer sheet.

Part A: Selected Response (36 Questions)

Instructions for Selected Response

- Read each question carefully and decide which of the choices **best** completes the statement or answers the question.
- Locate that question number on the separate answer sheet provided and fill in the space that corresponds to your choice.
- **Use an HB pencil only** for the machine-scored answer sheet.
- If you wish to change an answer, erase **all** traces of your first answer.

1. When calculating the sum $4\frac{2}{3} + 5\frac{1}{6} - 3\frac{5}{8}$, the lowest common denominator is

A. 8
B. 17
C. 24
D. 144

2. Janice and three of her friends shared $4\frac{1}{2}$ L of pop. If all of the group shared the pop equally, how much would each member of the group receive?

A. $7\frac{1}{2}$ L

B. $1\frac{1}{2}$ L

C. $1\frac{1}{8}$ L

D. $\frac{1}{2}$ L

3. The expression $0.21 \div 0.3$ is equivalent to the fraction

A. $\frac{21}{3}$

B. $\frac{210}{3}$

C. $\frac{21}{300}$

D. $\frac{21}{30}$

4. A \$65.00 pair of jeans is on sale. The advertisement states that the jeans will be reduced by 15%. The sale price, before tax, is

A. \$9.75
B. \$50.00
C. \$55.25
D. \$64.85

5. The quantity 2^4 means

A. $2 + 4$
B. 2×4
C. $2 + 2 + 2 + 2$
D. $2 \times 2 \times 2 \times 2$

6. The value of $(-3b)^2$, when $b = 21$, is

A. 3 969
B. 1 323
C. –1 323
D. –3 969

7. The number of lines of symmetry in a square is

A. 0
B. 2
C. 4
D. 8

8. The number of degrees in a complete circle is

A. 360
B. 180
C. 100
D. 90

9. Mary has overdraft protection on her chequing account. Mary is overdrawn $186.00. If she deposits $325.00 to her chequing account, then her balance after the deposit is

A. $139.00
B. $511.00
C. overdrawn $139.00
D. overdrawn $511.00

10. A restaurant customer spent $12.00 Canadian for a meal, including taxes and tip. She paid with a $20 U.S. bill. The exchange rate used by the restaurant on that day was $1.00 U.S. = $1.40 Canadian. The customer's change, in Canadian funds, was

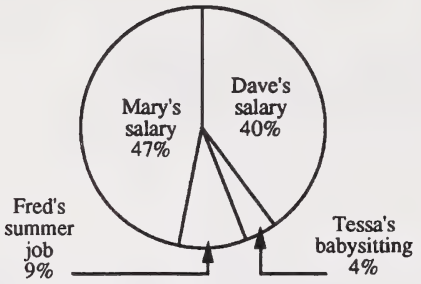
A. $16.00
B. $11.20
C. $8.00
D. $2.30

Use the following information to answer the next three questions.

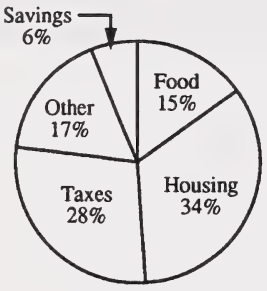
Family Budget

Mary and Dave drew up a budget for themselves and their two children, Fred and Tessa.

Total Annual Income



Total Annual Expenditure



11. The information that is **missing** from the budget graphs is the

A. percentage saved by the family
B. total dollars of income and expenditure
C. percentage of income earned by the children
D. number of people bringing income into the family

12. If the total annual income of the family was $65 000, Dave's annual income was

A. $16 250
B. $26 000
C. $39 000
D. $40 000

13. The percentage of family income budgeted for taxes is

A. 12%
B. 20%
C. 25%
D. 28%

---

14. While on holiday in Mexico, Terry paid 200 Mexican pesos for a leather purse. At the time of her purchase, the Mexican peso had an exchange rate of 6.58 pesos to the U.S. dollar, and the Canadian dollar had an exchange rate of $1.42 to the U.S. dollar. What is the cost of the purse in Canadian funds?

A. $1 868.72
B. $926.76
C. $43.16
D. $21.40

15. The manager of a pizza restaurant earns a salary of $650/month, and a commission on sales. The commission rate is 5% of the sales up to and including $1 500, and 3% of all sales exceeding $1 500. In February, the total sales were $5 700. What would the manager earn in the month of February?

A. $821
B. $851
C. $935
D. $1 106

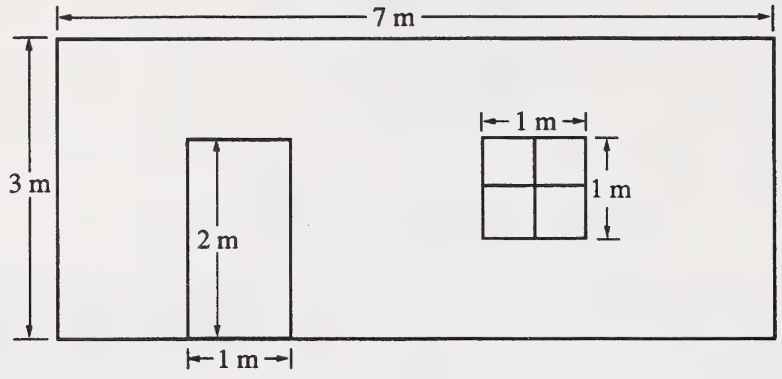
16. A roll of wallpaper is 0.70 m wide and covers an area of 5.6 m^2. The length is

A. 3.92 m
B. 6.30 m
C. 8.00 m
D. 12.5 m

Use the following information to answer the next question.

Papering a Wall

The diagram below shows a wall that contains a door and a window. The owner of the house plans to wallpaper this wall.



17. Assuming that none of the wallpaper is wasted, the area of wallpaper required is

A. 24 m^2
B. 21 m^2
C. 18 m^2
D. 10 m^2

---

18. At the end of 1994, Canada's national debt was approximately 546 billion dollars, and the national population was approximately 28 million. Assuming that the national debt is shared equally by each Canadian, then each person's share is **approximately**

A. $195 000
B. $19 500
C. $1 950
D. $19.50

19. A full-page map of Alberta has a scale of 1 cm to 40 km. The distance from Edmonton to Fort McMurray is 468 km. Using the scale on this map, this distance from Edmonton to Fort McMurray is represented by a line of length

A. 4.7 cm
B. 11.7 cm
C. 18.7 cm
D. 42.8 cm

20. Bill rented a houseboat for a two-week period. He had to pay a fixed rental charge of $322 per week and $1.30 for every kilometre travelled. He travelled a total of 120 kilometres over the two weeks. The total charge was

A. $323.30
B. $478.00
C. $644.00
D. $800.00

21. In Alberta hotels, guests pay a 12% tax on the room rate and a 7% tax on restaurant meals. Sharon has a bill, before taxes, of $140 for her room and $75 for her restaurant meals. How much tax will Sharon pay?

A. $15.05
B. $18.80
C. $22.05
D. $25.80

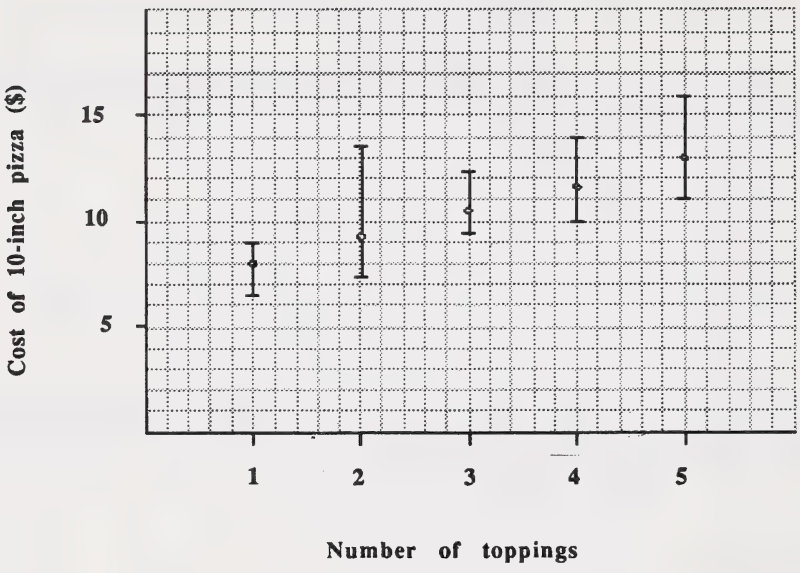
22. A person buying an item in Prince Edward Island has to pay the 7% federal tax (GST) and the 11% provincial sales tax (PST). The PST is calculated on the cost of an item with the GST already included. A coat costs $250.00 before either tax. How much will this coat cost to the customer in Prince Edward Island, after paying both taxes?

A. $267.50
B. $277.50
C. $295.00
D. $296.93

Use the following information to answer the next two questions.

Pizza Prices for Different Numbers of Toppings

The graph below shows the prices of various 10-inch pizzas on the vertical axis, and the number of toppings on the horizontal axis.



23. The cost of the most expensive 4-topping, 10-inch pizza is

A. $10.00
B. $11.75
C. $14.00
D. $16.00

24. There is the most variation in the prices of 10-inch pizzas with

A. 2 toppings
B. 3 toppings
C. 4 toppings
D. 5 toppings

Use the following information to answer the next three questions.

Deductions from a Paycheque

Luigi works part-time. During April, he worked 117 hours at $8.00 per hour. His deductions were $28.08 for unemployment insurance, $16.00 for health care, $17.81 for the Canada Pension Plan, and $103.48 for income tax.

25. Luigi's take-home pay for April, after deductions, was

A. $165.37
B. $770.63
C. $874.11
D. $936.00

26. There is a proposal to double the rate of Canada Pension Plan deductions for all employees. Luigi's **new** Canada Pension Plan deduction will be

A. $56.16
B. $35.62
C. $17.81
D. $8.90

27. As a percentage of his total earnings, Luigi's rate of income tax was

A. 21.5%
B. 17.7%
C. 13.4%
D. 11.1%

Use the following information to answer the next three questions.

Life Insurance

Terry, who is 35 years old, has life insurance to protect the family in case he dies before the mortgage is paid. For each $100 000 of coverage, the premium is $41.25 per month for smokers and $28.08 per month for non-smokers.

28. Terry smokes, and he requires $300 000 of coverage. His monthly premium is

A. $123.75
B. $84.24
C. $13.75
D. $9.36

29. If a smoker gives up smoking, the monthly premium is reduced. For a $500 000 policy, the monthly **savings** in premiums will be

A. $206.25
B. $140.40
C. $69.33
D. $65.85

30. The recommended level of coverage is considered to be five times the yearly salary. Donna, who is also 35 years old, does not smoke, and she earns $30 000 per year. Her monthly premium is

A. $63.38
B. $42.12
C. $12.38
D. $8.42

Use the following information to answer the next three questions.

Building and Paying for a House

Frank and his family want to buy a house in a new development. The house has an area of 118 m^2 and stands on a lot that has a front width of 14 m. Land costs are \$3 000 per metre of front width, and construction costs are \$650/m^2.

The bank is prepared to lend up to either 90% of the cost of both land and house, or twice the yearly family income, whichever is lower.

31. The total cost of land and house that Frank and his family want to buy will be

A. \$118 700
B. \$106 830
C. \$76 700
D. \$42 000

32. Frank and his family have a yearly total income of \$74 000. The maximum amount that Frank can borrow is

A. \$148 000
B. \$106 830
C. \$48 889
D. \$37 000

33. To help home buyers, the builder is prepared to reduce the construction costs by 15% if the buyer finishes the decorating and carpeting. The saving to Frank and his family will be

A. \$17 805
B. \$11 505
C. \$6 300
D. \$1 770

Use the following information to answer the next three questions.

Mariko's Paycheque

Mariko works in a shoe store, and is paid partly for her hours and partly as a commission on her sales. The formula used to calculate her monthly earnings E is as follows:

$$E = 6h + 0.03s$$

where h is the number of hours worked, and s the dollar value of the sales Mariko made.

34. In words, Mariko earns

A. \$6.00 per hour and 3% of the value of her sales
B. \$6.00 per hour and \$3.00 per item sold
C. \$6.00 and 3% of the value of her sales
D. \$6.00 and \$3.00 per item sold

35. If, in a particular month, Mariko worked 130 hours and sold \$4 200 worth of shoes, her total earnings would be

A. \$126.00
B. \$780.00
C. \$783.90
D. \$906.00

36. In December, Mariko earned \$1 287 and sold \$12 900 worth of shoes. How much of her earnings were from her commission?

A \$1 284
B. \$900
C. \$387
D. \$214

Part B: Written Response

Instructions

There are four written-response questions for a total of 20 marks in this section.

Marks are assigned using the *General Scoring Criteria*, which give marks for work and communication, as well as to final answers. In particular, **correct answers with no work shown receive one mark only.**

Please write your answer in the test booklet as neatly as possible.

(5 marks) **1.** Janice graduated from school and found a job paying $11.75 per hour for 150 hours of work per month. She calculated that she had 18% of her salary deducted from her monthly paycheques.

a. Calculate Janice's gross income before deductions.

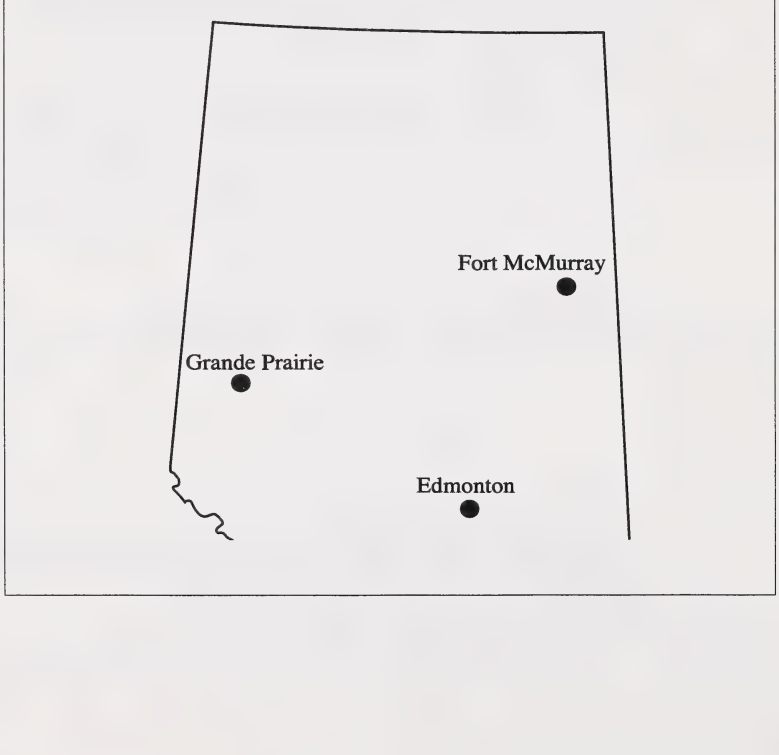
b. Calculate Janice's monthly take-home pay.

c. Janice has to pay off her five-year student loan at $214.50 per month. She wants to pay no more than one third of the rest of her paycheque for her rent. What is the **maximum** monthly rent that she can afford?

(5 marks) **2.** The following table shows the kilometres between three major cities in Alberta.

From/To	Grande Prairie	Fort McMurray	Edmonton
Grande Prairie	0	720	460
Fort McMurray	720	0	445
Edmonton	460	445	0

The map of northern Alberta, with the three cities marked on it, is found below.



a. How much **distance** is saved in travelling from Grande Prairie to Fort McMurray by the direct route, rather than going through Edmonton?

b. If a car can average 90 km/h when travelling by the direct route, and average 100 km/h going through Edmonton, how much **time** is saved by travelling by the direct route?

(5 marks) **3.** Jorge is looking at his monthly bank statement. His opening balance at the beginning of the month was $725.90. He deposited two paycheques, each for $1 147.78, and one tax refund cheque for $561.20. He wrote 17 cheques, totalling $1 476.25, and made 9 bank machine withdrawals totalling $475.00.

a. Before any service charges were taken out, what was Jorge's balance at the end of the month?

b. The service charges are 60 cents for each cheque written and 35 cents for each bank machine withdrawal made. There are no service charges for deposits. How much did Jorge pay in service charges, and what was his final bank balance at the end of the month?

(5 marks) **4.** The calculation to be done is $\frac{21.6}{12.3 \times (14.5 - 7.9)}$.

a. Use your calculator to find the result, and explain how you did this calculation on your calculator.

Your explanation can be
either
a listing, in order, of the keystrokes used
or
an explanation of the reasoning used in doing the calculation.

b. Estimate the result, and indicate using words, charts, or formulae how you did the estimate.

Mathematics 24

Performance Assessment

Name: _____

Performance Assessment

Description

Time allotted: 90 minutes
Total possible marks: 24

This is a **closed-book** test consisting of **three** tasks:

Task 1
starts on page 2 and has a value of 8 marks.

Task 2
starts on page 4 and has a value of 8 marks.

Task 3
starts on page 6 and has a value of 8 marks.

Instructions

- Fill in the information required on the test booklet as directed by your teacher.
- You are expected to provide your own calculator; the school will provide measuring cylinders and cups for Task 1.
- Show all your work, as marks will be assigned using the *General Scoring Criteria*, which assign marks to mathematical processes and to mathematical communication, as well as to final answers. In particular, **correct answers with no work shown receive one mark only, out of the eight possible.**

Background

Consumers are faced with mathematical tasks in a variety of situations. The situations presented here set mathematical tasks for you, which relate to real-life experiences.

In your first task, you will be comparing prices and sizes of soft drinks, to determine the best value for money when buying pop.

The second situation will present you with the task of calculating and displaying the costs of running a car for a year.

In the third task, you will design the main floor of a house, using the dimensions provided.

Task 1: Soft Drink Bargains

Ahmed had noticed that the prices of his favourite soft drink varied considerably, as did the sizes of the containers. He collected the following data on prices and sizes.

Store name	Price for small pop	Price for medium pop	Price for large pop
Discount Joe	\$0.85 per 350 mL	\$1.29 per 550 mL	\$1.69 per 900 mL
Luigi's	\$0.79 per 300 mL	\$1.09 per 500 mL	\$1.29 per 750 mL
Taco Stand	\$0.59 for cup *A*	\$1.19 for cup *B*	\$1.89 for cup *C*

a. Use a measuring cylinder to measure the volumes of each of the cups *A*, *B*, and *C*.

b. Determine the best price for each size of drink (small, medium, and large). Show your calculations.

Task 2: Operating a Car for a Year

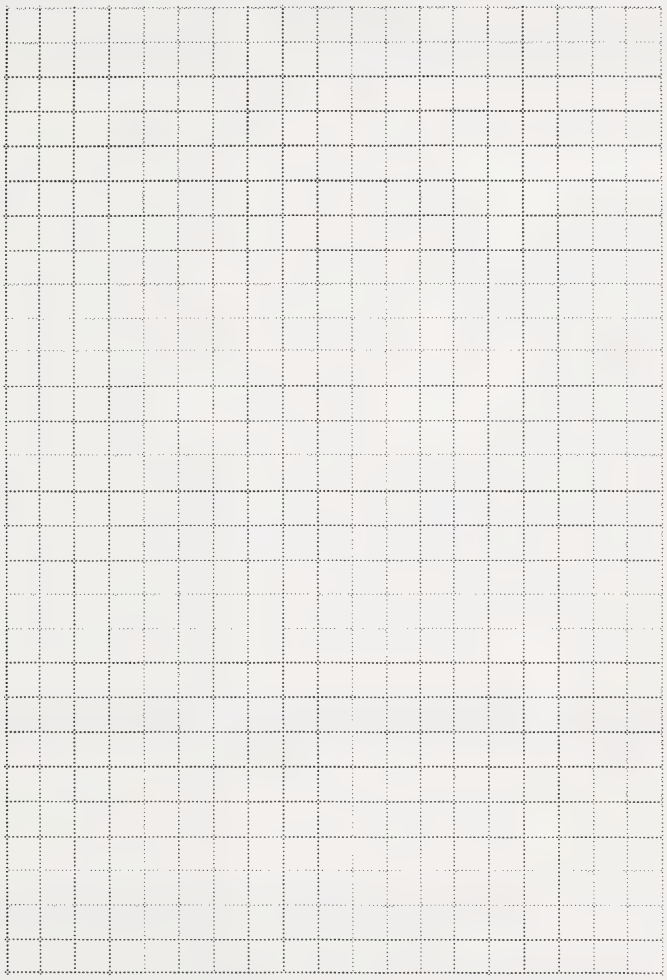
Roger kept good records of the costs of running his 1993 compact car for the calendar year 1995. He found the following costs:

Cost category	Costs incurred
Depreciation	$2 650.00
Insurance and registration	$840.00
Tires	4 at $72.50 each
Oil changes	7 at $32.95 each
Gasoline	3 100 L at 44.9 cents/litre
Repairs	$115.00 for a tune-up $277.50 for brakes
Parking	$44.50 per month for 12 months
Washing	27 washes at $4.25 each
Interest on borrowed money	$1 145.00

a. What was the total cost, to Roger, of running his car for the year?

b. If the price of gasoline increased to 61.5 cents/litre, how much **extra** would it cost Roger to run his car for the year?

c. Display the budget as a graph.



Task 3: House Floor Plans

You have won $200 000 in a lottery and decide to build a house. Because your grandfather will be coming to live with you, you decide to build a house on one level. The city council does not allow any basements, so there are no stairs in the house at all. There must be sufficient hallways and passages to allow for the easy movement of people through the house.

Make your house plan with main floor rooms of the following areas:

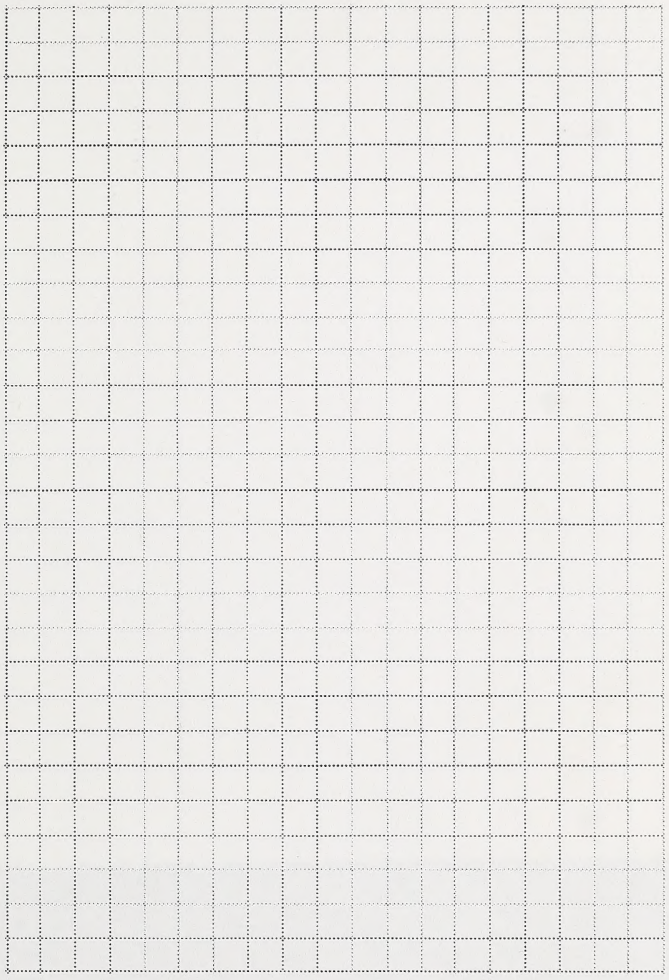
Room or area on main floor	Total area in square metres
Kitchen/dining room	36
Living/family room	72
2 bathrooms	15 in total
3 bedrooms	80 in total
Two-car garage	42
Hallways and passages	sufficient for easy movement of people

a. What would be reasonable for the length and the width of the two-car garage?

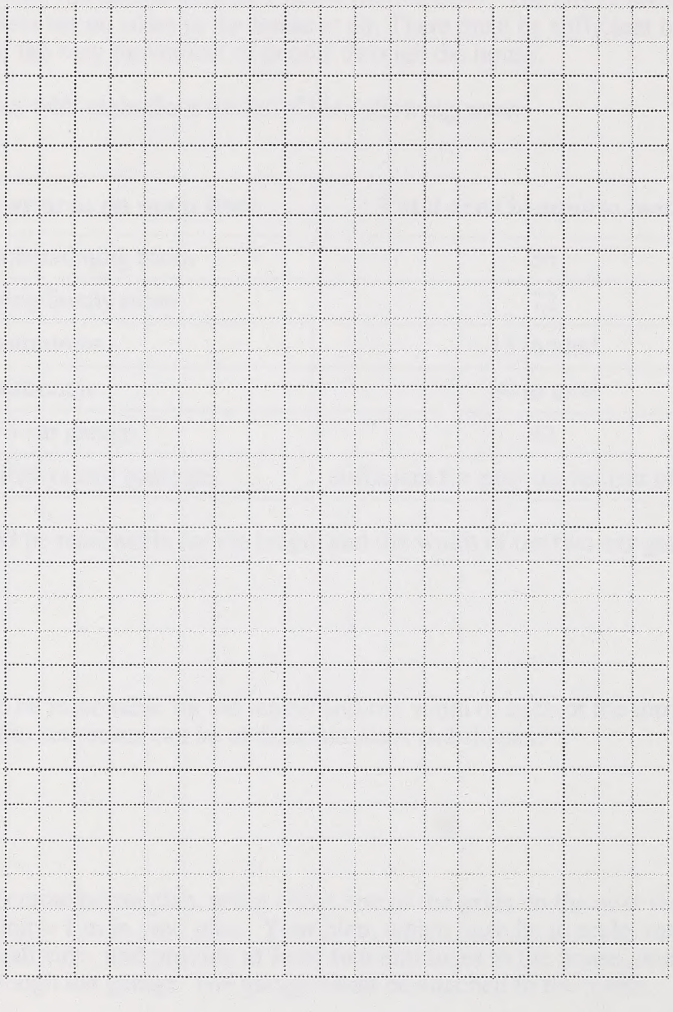
b. What could be reasonable for the length and the width of each of the three bedrooms, given that the bedrooms can be of different sizes and shapes?

c. Draw an accurate house plan, using either one of the grids on the next two pages. Use a scale of 1 unit = 1 m in your plan. Your plan, which must be to scale, **must** include all doors and hallways, and provide **at least two** entrances to the house, one from the front and one through the garage. The garage **must** be attached to the house.

Scale: 1 unit = 1 m



(If you have made mistakes, there is another grid you can use on the next page)



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